

Metro-North Railroad

Harmon Yard - OUI/OUII: Off-Site and NAPL Area L1 Monitoring Wells

Metro-North Railroad (MNR) intends to install six (6) off-site monitoring wells (designated Well-A through Well-F) and one (1) on-site monitoring well (designated SP-North) in the approximate locations depicted on the attached figure. This document describes the requirements for the installation of these monitoring wells.

- The locations shown on the attached figure are approximate, but the monitoring wells will be installed as close to the locations shown as possible depending on the location of buried utilities and other obstructions that will be determined at the time of installation. [Note: The off-site monitoring wells are to be installed in the grass area immediately south of the roadway, but as close to the roadway as possible. Monitoring well SP-North, in conjunction with an existing monitoring well designated WB-9, will be used to evaluate the presence of NAPL that could potentially migrate off-site around a sheet pile wall installed in NAPL Area L1. These wells are/will be located near the northern (SP-North) and southern (WB-9) terminus of the sheet pile.]
- As a precaution to preclude damaging unmarked utilities, it is anticipated that a turbo vac will be used to advance the test boring from the ground surface to approximately 5 feet (ft.) below ground surface (bgs). Thereafter a track-mounted Geoprobe 6610DT will be used to complete the test boring and collect samples in consecutive 5-foot long intervals. The samples collected will be observed to evaluate subsurface conditions and evidence of potential environmental impact (e.g., unusual odors, staining, evidence of free product, etc.). A photoionization detector (PID) will be used to screen the soil samples collected. The information collected will be summarized in field books and test boring logs will be prepared for each test boring advanced.
- During the advancement of the test borings, a Community Air Monitoring Plan (CAMP), generally consistent with the requirements outlined in Appendix 1A of DER-10 will be implemented.
- Based on available information, it is anticipated that each monitoring well will be installed to a depth of approximately 20 ft. bgs. The actual depth will be determined in the field by a MNR representative. Copies of select test boring logs/monitoring well installation diagrams for monitoring wells that have been installed by MNR in proximity of the proposed new monitoring wells are included in Attachment A. [Note: An installation log for well WB-9 could not be located. However, this well was evaluated and re-developed on April 23, 2015. During this work, it was determined that this 2-inch diameter well is approximately 17.2 ft. deep. On April 23, 2015, groundwater was measured at a depth 6.37 ft. bgs, and no free product was observed in this well.]

- Following completion of the test borings, a 1-inch diameter flush-coupled PVC monitoring well with 10 ft. to 15 ft. long slotted well screen (10 slot) connected to solid riser pipe extending to the ground surface will be installed within each test boring. The bottom of the well screen should be placed approximately 0.5 ft. above the bottom of the test boring and the screen should be backfilled with a filter sand pack that extends at least 0.5 ft. above the top of the well screen. A minimum 1-foot thick bentonite seal should be installed above the sand pack and a cement/bentonite grout should be placed to within about 1 ft. of the ground surface.
- The off-site monitoring wells Well-A through Well-F will be completed as flush-mount installations with a steel protective gate box installed within a concrete pad that extends from the ground surface to the top of the cement/bentonite seal. The on-site monitoring well SP-North will be completed with a steel stick-up protective casing that is installed within a concrete pad.
- Drill cuttings generated during the installation of the monitoring wells will be containerized and placed in a location designated by MNR.

Following installation, the monitoring wells will be developed by pumping and/or bailing to remove accumulated sediments and to assure the wells are functioning. During development, the purge water will be observed for evidence of free product. The water generated during development will be collected and placed in containers for subsequent characterization testing and disposal by MNR.

The developed wells will be evaluated initially on a weekly basis to assess the presence/thickness of free product (if any) and depth to groundwater. If free product in excess of 0.5 inches is detected, it will be removed by pumping or bailing and placed in a container for subsequent characterization testing and disposal by MNR. Depending on the amount of free product encountered, the monitoring frequency will be adjusted accordingly. For example, if free product in excess of 0.5 ft. is detected and the free product returns following purging daily monitoring may be required. Conversely if free product does not accumulate in a well the monitoring frequency may be increased to monthly.

Following at least six months of monitoring, a report summarizing the results of the work conducted and the results of the monitoring completed will be prepared. This report will include recommendations for additional studies or remedial activities if such work is deemed necessary.

Xerox432AnsiB-2; 11 x 17
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Time Plotted: Monday, September 12, 2016 2:51:04 PM
 File Name: P:\Drawings\Metro\Harmon\Remediation-46\OU-II Site Monitoring Report Sept 2016.dwg



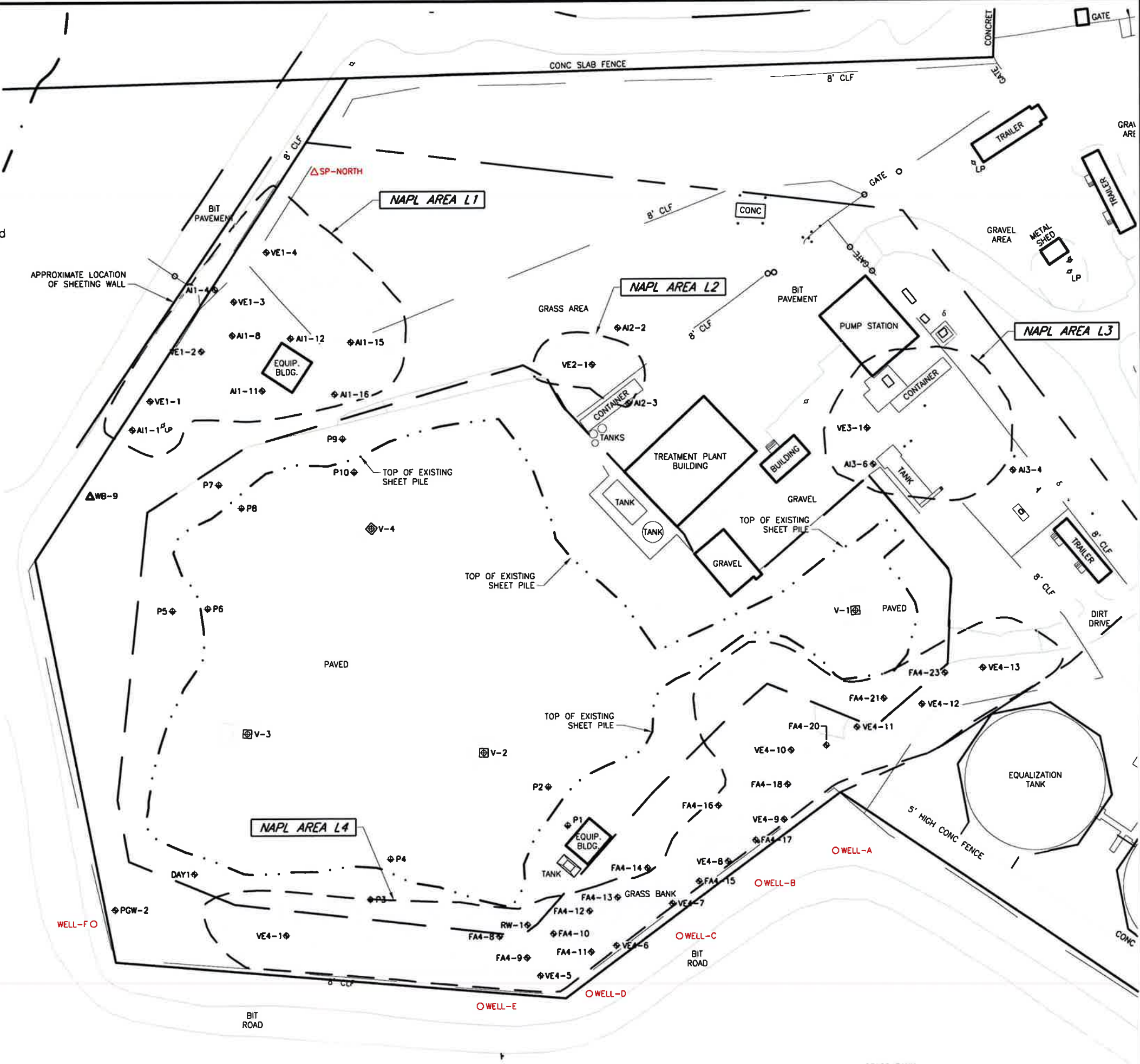
NOTES:

1. This drawing was prepared from a CAD base file provided by others, from a drawing by ERM, entitled "EXISTING SITE PLAN AND SURVEY CONROL" sheet No. C-1 dated 7/31/00 and from a drawing by ERM, "SITE PLAN WITH LOCATIONS OF PROPOSED WELLS AND SHEET PILING", sheet No. C-2, dated 7/31/00.
2. Operable Unit II (OU-II) remedy well locations were determined from coordinate values listed on the ERM drawings identified in note No. 1.

LEGEND:

- V-2 OU-I Well Within Vault
- P8 Piezometer Installed Around OU-I/OU-II Sheet Pile Wall
- VE4-1 Well Within OU-II
- WB-9 Existing Monitoring Well Near Southern Terminus Of NAPL Area L1 Sheet Pile Wall
- SP-NORTH Proposed Monitoring Well Near Northern Terminus Of NAPL Area L1 Sheet Pile Wall
- Approximate NAPL Area
- Approximate Fence And Harmon Yard Property Line Location
- Approximate Location Of Sheet Pile Wall Around Remediated Former Lagoon Area (OU-I)
- Property Line
- WELL-A Proposed Off-Site Monitoring Well

**SITE PLAN
 OPERABLE UNIT II**
 1" = 60'



DATE	9-2016
PROJECT MANAGER	RLK
DATE DRAWN	9-12-2016
DRAWN BY	RJM
DATE ISSUED	9-12-2016
SCALE	1" = 60'

day
DAY ENGINEERING, P.C.
 ENVIRONMENTAL ENGINEERING CONSULTANTS
 ROCHESTER, NEW YORK 14614-1008
 NEW YORK, NEW YORK 10016-0710

PROJECT TITLE
**METRO-NORTH RAILROAD
 HARMON YARD OPERABLE UNITS OU-I AND OU-II
 CROTON-ON-HUDSON, NEW YORK**

DRAWING TITLE
Site Plan With NAPL Areas And Well Locations

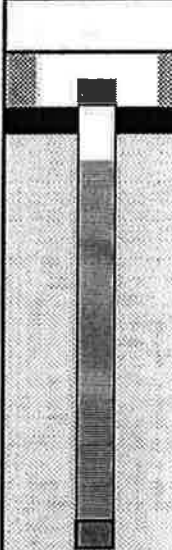





PROJECT NO.
15-3356M (46)

ATTACHMENT A

Attachment 2
Geologic Log and Well Construction Details
Well ID: VE4-9

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad		Contract No.: 9464		Depth to Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: Harmon Lagoon Area OU-II		Address: Croton-on-Hudson, NY		Date	DTW		
Drilling Company: Aquifer Drilling and Testing, Inc.		Method: Hollow Stem Augers				Measuring Point Elevation	
Date Started: 07/16/01		Date Completed: 07/16/01					
Completion Depth: 20'		ENVIROTRAC Geologist: Tom Bosshard					
MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)		
		Reco- very (ft.)	Blow per 6 in.	OVM (ppm)			
	0				Brush Surface		
	39		NA	0	0-4' Medium to fine grained brown sand some clay; dry, no odor.		
	5						
	42		NA	3	4-8' Medium to fine grained brown sand some clay; grey staining beginning at approximately 5', wet at approximately 6', petroleum-like odor.		
	10						
	15						
	20						
LEGEND:					<u>Well Construction Details</u>		
	Cement				<u>Well Development Details</u>		
	Bentonite Seal				Date:		
	Gravel pack (morle #1)				Method:		
	Screen				Volume of water removed:		
	End/Top Cap				Physical Characteristics (color/turbidity/odor)		
					Before:		
					During:		
					After:		
					Comments:		
					Bottom of Well: 20'		
					Screen Zone: 5'-20'		
					Casing material: 4" SCH 40		
					Screen material: 4" 10 slot		
					SAND Pack: 4'-20'		
					Amount Sand: 6 Bags #1		
					Bentonite Seal: 3'-4'		
					Amount Bentonite: 1 Bag		
					Cement Surface:		
					Seal:		
					Remarks: Breathing Zone PID = 0 ppm.		

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: FA4-17

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad		Contract No.: 9464		Depth to Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: Harmon Lagoon Area OU-II		Address: Croton-on-Hudson, NY		Date	DTW	Measuring Point Elevation	
Drilling Company: Aquifer Drilling and Testing, Inc.		Method: Hollow Stem Augers					
Date Started: 07/12/01		Date Completed: 07/12/01					
Completion Depth: 15'		ENVIROTRAC Geologist: Tom Bosshard					
MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)		
		Recovery (in.)	Blow per 6 in.	OVM (ppm)			
	0				Brush Surface		
	35		NA	0	0-4' Medium to fine grained brown sand little clay; dry, no odor.		
	5		NA	7	4-8' Medium to fine grained brown sand; grey staining beginning at approximately 6', wet at approximately 6.5', petroleum-like odor,		
	10						
	15						
LEGEND: 		Well Construction Details Bottom of Well: 15' Screen Zone: 5'-15' Casing material: 2" SCH 40 Screen material: 2" 10 slot SAND Pack: 4'-15' Amount Sand: 3 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface Seal: Remarks: Breathing Zone PID = 0 ppm.		Well Development Details Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:			

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: VE4-8

ENVIROTRAC LTD.
80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad		Contract No.: 9464		Depth to Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: Harmon Lagoon Area OU-II		Address: Croton-on-Hudson, NY		Date	DTW	Measuring Point Elevation	
Drilling Company: Aquifer Drilling and Testing, Inc.		Method: Hollow Stem Augers					
Date Started: 07/16/01		Date Completed: 07/16/01		Completion Depth: 20'		ENVIROTRAC Geologist: Tom Bosshard	
MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)		
		Recovery (in.)	Blow per 6 in.	OVM (ppm)			
	0				Brush Surface		
	43	NA	0	0	0-4' Medium to fine grained brown sand some clay; dry, no odor.		
	5						
	46	NA	0	0	4-8' Medium to fine grained brown sand some clay; grey staining beginning at approximately 7', wet at approximately 7', petroleum-like odor.		
	10						
	15						
	20						
LEGEND:		<u>Well Construction Details</u>			<u>Well Development Details</u>		
	Cement	Bottom of Well:	20'	Date:			
	Bentonite Seal	Screen Zone:	5'-20'	Method:			
	Gravel pack (morie #1)	Casing material:	4" SCH 40	Volume of water removed:			
	Screen	Screen material:	4" 10 slot	Physical Characteristics (color/turbidity/odor)			
	End/Top Cap	SAND Pack:	4'-20'	Before:			
		Amount Sand:	6 Bags #1	During:			
		Bentonite Seal:	3'-4'	After:			
		Amount Bentonite:	1 Bag	Comments:			
		Cement Surface:					
		Seal:					
		Remarks:	Breathing Zone PID = 0 ppm.				

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: FA4-15

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad	Contract No.: 9464	Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Harmon Lagoon Area OU-II	Address: Croton-on-Hudson, NY	Date	DTW	Measuring Point Elevation
Drilling Company: Aquifer Drilling and Testing, Inc.	Method: Hollow Stem Augers			
Date Started: 07/12/01	Date Completed: 07/12/01			
Completion Depth: 15'	ENVIROTRAC Geologist: Tom Bosshard			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)																										
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)																											
0					Brush Surface																										
39			NA	0	0-4' Medium to fine grained brown sand little clay; dry, no odor.																										
5		42	NA	15	4-8' Medium to fine grained brown sand; grey staining beginning at approximately 6', wet at approximately 7', petroleum-like odor.																										
10																															
15																															
<table style="width: 100%; border: none;"> <tr> <td style="width: 40%; vertical-align: top;"> LEGEND: Cement Bentonite Seal Gravel pack (morie #1) Screen End/Top Cap </td> <td style="width: 60%; vertical-align: top;"> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><u>Well Construction Details.</u></td> <td style="width: 50%;"><u>Well Development Details.</u></td> </tr> <tr> <td>Bottom of Well: 15'</td> <td>Date:</td> </tr> <tr> <td>Screen Zone: 5'-15'</td> <td>Method:</td> </tr> <tr> <td>Casing material: 2" SCH 40</td> <td>Volume of water removed:</td> </tr> <tr> <td>Screen material: 2" 10 slot</td> <td>Physical Characteristics (color/turbidity/odor)</td> </tr> <tr> <td>SAND Pack: 4'-15'</td> <td>Before:</td> </tr> <tr> <td>Amount Sand: 3 Bags #1</td> <td>During:</td> </tr> <tr> <td>Bentonite Seal: 3'-4'</td> <td>After:</td> </tr> <tr> <td>Amount Bentonite: 1 Bag</td> <td>Comments:</td> </tr> <tr> <td>Cement Surface:</td> <td></td> </tr> <tr> <td>Seal:</td> <td></td> </tr> <tr> <td>Remarks: Breathing Zone PID = 0 ppm.</td> <td></td> </tr> </table> </td> </tr> </table>						LEGEND: Cement Bentonite Seal Gravel pack (morie #1) Screen End/Top Cap	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><u>Well Construction Details.</u></td> <td style="width: 50%;"><u>Well Development Details.</u></td> </tr> <tr> <td>Bottom of Well: 15'</td> <td>Date:</td> </tr> <tr> <td>Screen Zone: 5'-15'</td> <td>Method:</td> </tr> <tr> <td>Casing material: 2" SCH 40</td> <td>Volume of water removed:</td> </tr> <tr> <td>Screen material: 2" 10 slot</td> <td>Physical Characteristics (color/turbidity/odor)</td> </tr> <tr> <td>SAND Pack: 4'-15'</td> <td>Before:</td> </tr> <tr> <td>Amount Sand: 3 Bags #1</td> <td>During:</td> </tr> <tr> <td>Bentonite Seal: 3'-4'</td> <td>After:</td> </tr> <tr> <td>Amount Bentonite: 1 Bag</td> <td>Comments:</td> </tr> <tr> <td>Cement Surface:</td> <td></td> </tr> <tr> <td>Seal:</td> <td></td> </tr> <tr> <td>Remarks: Breathing Zone PID = 0 ppm.</td> <td></td> </tr> </table>	<u>Well Construction Details.</u>	<u>Well Development Details.</u>	Bottom of Well: 15'	Date:	Screen Zone: 5'-15'	Method:	Casing material: 2" SCH 40	Volume of water removed:	Screen material: 2" 10 slot	Physical Characteristics (color/turbidity/odor)	SAND Pack: 4'-15'	Before:	Amount Sand: 3 Bags #1	During:	Bentonite Seal: 3'-4'	After:	Amount Bentonite: 1 Bag	Comments:	Cement Surface:		Seal:		Remarks: Breathing Zone PID = 0 ppm.	
LEGEND: Cement Bentonite Seal Gravel pack (morie #1) Screen End/Top Cap	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><u>Well Construction Details.</u></td> <td style="width: 50%;"><u>Well Development Details.</u></td> </tr> <tr> <td>Bottom of Well: 15'</td> <td>Date:</td> </tr> <tr> <td>Screen Zone: 5'-15'</td> <td>Method:</td> </tr> <tr> <td>Casing material: 2" SCH 40</td> <td>Volume of water removed:</td> </tr> <tr> <td>Screen material: 2" 10 slot</td> <td>Physical Characteristics (color/turbidity/odor)</td> </tr> <tr> <td>SAND Pack: 4'-15'</td> <td>Before:</td> </tr> <tr> <td>Amount Sand: 3 Bags #1</td> <td>During:</td> </tr> <tr> <td>Bentonite Seal: 3'-4'</td> <td>After:</td> </tr> <tr> <td>Amount Bentonite: 1 Bag</td> <td>Comments:</td> </tr> <tr> <td>Cement Surface:</td> <td></td> </tr> <tr> <td>Seal:</td> <td></td> </tr> <tr> <td>Remarks: Breathing Zone PID = 0 ppm.</td> <td></td> </tr> </table>	<u>Well Construction Details.</u>	<u>Well Development Details.</u>	Bottom of Well: 15'	Date:	Screen Zone: 5'-15'	Method:	Casing material: 2" SCH 40	Volume of water removed:	Screen material: 2" 10 slot	Physical Characteristics (color/turbidity/odor)	SAND Pack: 4'-15'	Before:	Amount Sand: 3 Bags #1	During:	Bentonite Seal: 3'-4'	After:	Amount Bentonite: 1 Bag	Comments:	Cement Surface:		Seal:		Remarks: Breathing Zone PID = 0 ppm.							
<u>Well Construction Details.</u>	<u>Well Development Details.</u>																														
Bottom of Well: 15'	Date:																														
Screen Zone: 5'-15'	Method:																														
Casing material: 2" SCH 40	Volume of water removed:																														
Screen material: 2" 10 slot	Physical Characteristics (color/turbidity/odor)																														
SAND Pack: 4'-15'	Before:																														
Amount Sand: 3 Bags #1	During:																														
Bentonite Seal: 3'-4'	After:																														
Amount Bentonite: 1 Bag	Comments:																														
Cement Surface:																															
Seal:																															
Remarks: Breathing Zone PID = 0 ppm.																															

NTS - Not to Scale

ND - Not Detected

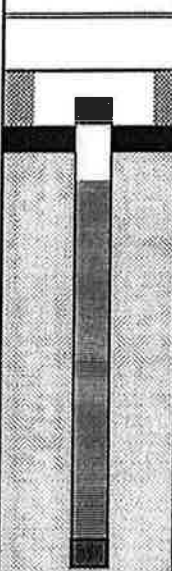

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: VE4-7

ENVIROTRAC LTD.
80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad	Contract No.: 9464	Depth to Water (ft. from measuring pt.)	Site Elevation Datum
Site Name: Harmon Lagoon Area OU-II	Address: Croton-on-Hudson, NY	Date	DTW
Drilling Company: Aquifer Drilling and Testing, Inc.	Method: Hollow Stem Augers		Measuring Point Elevation
Date Started: 07/17/01	Date Completed: 07/17/01		
Completion Depth: 20'	ENVIROTRAC Geologist: Tom Bosshard		

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)	
	0				Brush Surface
	41	NA	0		0-4' Medium to fine grained brown sand some clay; dry, no odor.
	5	41	NA	19	4-8' Medium to fine grained brown sand some clay; grey staining beginning at approximately 5', wet at approximately 6.5', petroleum-like odor.
	10				
	15				
	20				
LEGEND: 					Well Construction Details Bottom of Well: 20' Screen Zone: 5'-20' Casing material: 4" SCH 40 Screen material: 4" 10 slot SAND Pack: 4'-20' Amount Sand: 6 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface: Seal: Remarks: Breathing Zone PID = 0 ppm.
					Well Development Details Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:

NTS - Not to Scale

ND - Not Detected

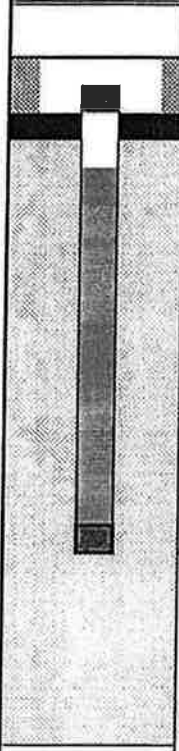

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: VE4-6

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad		Contract No.: 9464		Depth to Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: Harmon Lagoon Area OU-II		Address: Croton-on-Hudson, NY		Date		DTW	
Drilling Company: Aquifer Drilling and Testing, Inc.		Method: Hollow Stem Augers				Measuring Point Elevation	
Date Started: 07/17/01		Date Completed: 07/17/01					
Completion Depth: 20'		ENVIROTRAC Geologist: Tom Bosshard					
MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)		
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)			
	0 5 10 15 20	 35 45	 NA NA	 0 12	Brush Surface 0-4' Medium to fine grained brown sand little clay; dry, no odor. 4-8' Medium to fine grained brown sand some clay; grey staining beginning at approximately 7', wet at approximately 7', petroleum-like odor.		
LEGEND: 		Well Construction Details Bottom of Well: 20' Screen Zone: 5'-20' Casing material: 4" SCH 40 Screen material: 4" 10 slot SAND Pack: 4'-20' Amount Sand: 6 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface: Seal: Remarks: Breathing Zone PID = 0 ppm.		Well Development Details Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:			

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: FA4-14

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad	Contract No.: 9464	Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Harmon Lagoon Area OU-II	Address: Croton-on-Hudson, NY	Date	DTW	
Drilling Company: Aquifer Drilling and Testing, Inc.	Method: Hollow Stem Augers			Measuring Point Elevation
Date Started: 07/12/01	Date Completed: 07/12/01			
Completion Depth: 15'	ENVIROTRAC Geologist: Tom Bosshard			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)	
	0				Brush Surface
	34	NA	0		0-4' Medium to fine grained brown sand; dry, no odor.
	5	43	NA	1	4-8' Medium to fine grained brown sand; dry, grey staining beginning at approximately 7', petroleum-like odor.
	42	NA	10		8-12' Medium to fine grained grey stained sand; wet at approximately 11', petroleum-like odor.
10					
15					
LEGEND: 		<u>Well Construction Details</u> Bottom of Well: 15' Screen Zone: 5'-15' Casing material: 2" SCH 40 Screen material: 2" 10 slot SAND Pack: 4'-15' Amount Sand: 4 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface: Seal: Remarks: Breathing Zone PID = 0 ppm.		<u>Well Development Details</u> Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:	

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

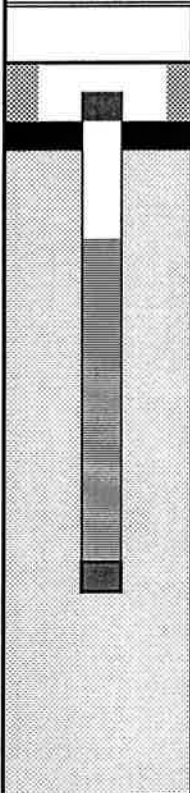
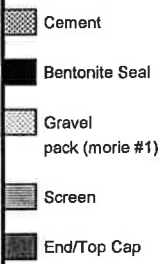
DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: FA4-12

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad	Contract No.: 9464	Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Harmon Lagoon Area OU-II	Address: Croton-on-Hudson, NY	Date	DTW	
Drilling Company: Aquifer Drilling and Testing, Inc.	Method: Hollow Stem Augers			Measuring Point Elevation
Date Started: 07/12/01	Date Completed: 07/12/01			
Completion Depth: 15'	ENVIROTRAC Geologist: Tom Bosshard			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)	
	0				Brush Surface
	41	NA	0		0-4' Medium to fine grained brown sand; dry, no odor.
	46	NA	14		4-8' Medium to fine grained brown sand; grey staining beginning at approximately 7', wet at approximately 8', petroleum-like odor.
	10				
	15				
LEGEND: 		<u>Well Construction Details</u> Bottom of Well: 15' Screen Zone: 5'-15' Casing material: 2" SCH 40 Screen material: 2" 10 slot SAND Pack: 4'-15' Amount Sand: 3 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface: Seal: Remarks: Breathing Zone PID = 0 ppm.		<u>Well Development Details</u> Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:	

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

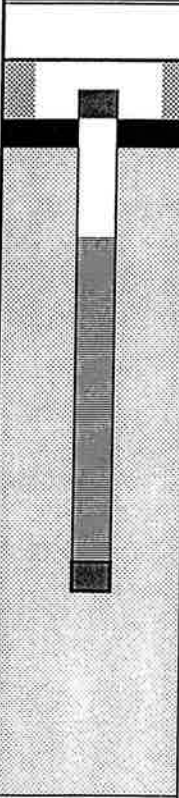
DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: PGW-2

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad	Contract No.: 9464	Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Harmon Lagoon Area OU-II	Address: Croton-on-Hudson, NY	Date	DTW	
Drilling Company: Aquifer Drilling and Testing, Inc.	Method: Hollow Stem Augers			Measuring Point Elevation
Date Started: 07/19/01	Date Completed: 07/19/01			
Completion Depth: 15'	ENVIROTRAC Geologist: Tom Bosshard			

MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)																																				
		Reco- very (in.)	Blow per 6 in.	OVM (ppm)																																					
	0				Brush Surface																																				
	42	NA	0		0-4' Medium to fine grained brown sand; dry, no odor.																																				
	5																																								
	41	NA	13		4-8' Medium to fine grained brown sand; grey staining at approximately 4.5', wet at approximately 5', petroleum-like odor.																																				
	10																																								
	15																																								
<table border="0"> <tr> <td>LEGEND:</td> <td><u>Well Construction Details</u></td> <td><u>Well Development Details</u></td> </tr> <tr> <td> Cement</td> <td>Bottom of Well: 15'</td> <td>Date:</td> </tr> <tr> <td> Bentonite Seal</td> <td>Screen Zone: 5'-15'</td> <td>Method:</td> </tr> <tr> <td> Gravel pack (morie #1)</td> <td>Casing material: 2" SCH 40</td> <td>Volume of water removed:</td> </tr> <tr> <td> Screen</td> <td>Screen material: 2" 10 slot</td> <td>Physical Characteristics (color/turbidity/odor)</td> </tr> <tr> <td> End/Top Cap</td> <td>SAND Pack: 4'-15'</td> <td>Before:</td> </tr> <tr> <td></td> <td>Amount Sand: 3 Bags #1</td> <td>During:</td> </tr> <tr> <td></td> <td>Bentonite Seal: 3'-4'</td> <td>After:</td> </tr> <tr> <td></td> <td>Amount Bentonite: 1 Bag</td> <td>Comments:</td> </tr> <tr> <td></td> <td>Cement Surface:</td> <td></td> </tr> <tr> <td></td> <td>Seal:</td> <td></td> </tr> <tr> <td></td> <td>Remarks: Breathing Zone PID = 0 ppm.</td> <td></td> </tr> </table>						LEGEND:	<u>Well Construction Details</u>	<u>Well Development Details</u>	Cement	Bottom of Well: 15'	Date:	Bentonite Seal	Screen Zone: 5'-15'	Method:	Gravel pack (morie #1)	Casing material: 2" SCH 40	Volume of water removed:	Screen	Screen material: 2" 10 slot	Physical Characteristics (color/turbidity/odor)	End/Top Cap	SAND Pack: 4'-15'	Before:		Amount Sand: 3 Bags #1	During:		Bentonite Seal: 3'-4'	After:		Amount Bentonite: 1 Bag	Comments:		Cement Surface:			Seal:			Remarks: Breathing Zone PID = 0 ppm.	
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NTS - Not to Scale

ND - Not Detected

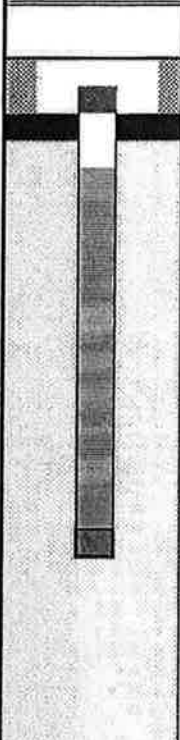
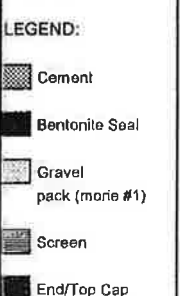
NM - Not Measured

DTW - Depth to Water

Attachment 2
Geologic Log and Well Construction Details
Well ID: VE1-4

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Metro-North Railroad		Contract No.: 9464		Depth to Water (ft. from measuring pt.)		Site Elevation Datum	
Site Name: Harmon Lagoon Area OU-II		Address: Croton-on-Hudson, NY		Date	DTW	Measuring Point Elevation	
Drilling Company: Aquifer Drilling and Testing, Inc.		Method: Hollow Stem Augers					
Date Started: 07/02/01		Date Completed: 07/02/01					
Completion Depth: 20'		ENVIROTRAC Geologist: Tom Bosshard					
MONITORING WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES			SOIL DESCRIPTION (Soil Samples Collected Continuously Using Geoprobe)		
		Recovery (in.)	Blow per 6 in.	OVm (ppm)			
	0				Gravel Surface		
	36	NA	0	0	0-4' Medium to fine grained dark sand and gravel and cinders; dry, no odor.		
	5	25	NA	0	4-8' Medium to fine grained dark sand and gravel and cinders; dry, petroleum-like odor.		
	10	16	NA	3	8-12' Medium to fine grained dark sand and gravel and cinders; dark staining, thick oily product absorbed throughout the sample beginning at 8', wet at approximately 8.6', petroleum-like odor.		
		15					
		20					
LEGEND: 		<u>Well Construction Details</u> Bottom of Well: 20' Screen Zone: 5'-20' Casing material: 4" SCH 40 Screen material: 4" 10 slot SAND Pack: 4'-20' Amount Sand: 15 Bags #1 Bentonite Seal: 3'-4' Amount Bentonite: 1 Bag Cement Surface: Seal: Remarks: Breathing Zone PID = 0 ppm.		<u>Well Development Details</u> Date: Method: Volume of water removed: Physical Characteristics (color/turbidity/odor) Before: During: After: Comments:			

NTS - Not to Scale

ND - Not Detected

NM - Not Measured

DTW - Depth to Water